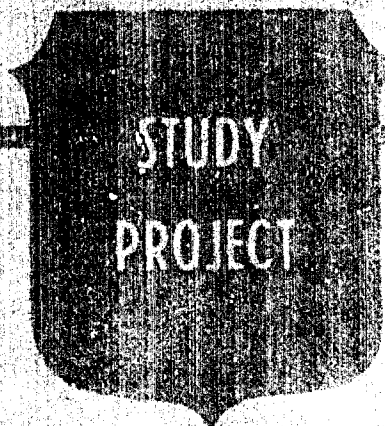


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UNITED STATES DEPENDENCE UPON FOREIGN SOURCES FOR HIGH-TECH COMPONENTS OF WEAPONS SYSTEMS

BY

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USAWC MILITARY STUDIES PROGRAM PAPER



UNITED STATES DEPENDENCE UPON FOREIGN SOURCES FOR HIGH-
TECH COMPONENTS OF WEAPONS SYSTEMS

An Individual Study Project

by

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Military weapons and the systems that support them have become very sophisticated in recent years. So, too, have the components used in those weapons systems. For various policy and economic reasons, an increasing number of the high-tech components are being produced offshore. The Department of Defense depends on foreign sources for high-tech components in such systems as the Sparrow, M-1 Tank, OH-58D, Sonobouy, F/A-18 and F-16. Accordingly, the ability of the nation's industrial base to sustain combat consumption rates in any protracted conflict will be negatively effected. Fortunately, the problem is just emerging and can be reversed. (C) 1

UNITED STATES DEPENDENCE UPON FOREIGN SOURCES FOR HIGH- TECH COMPONENTS OF WEAPONS SYSTEMS

INTRODUCTION

Military weapons and the systems that support them have become very sophisticated in recent years. So, too, have the components used in these weapons systems. There is no reason to believe that this trend will change as the Department of Defense will likely continue to use technology to counter the numbers advantage of possible opponents. Additionally, as tensions continue to lessen between the United States and the Soviet Union and military forces are drawn down, sophisticated weapons will remain important for their deterrent value.

Today, however, an increasing number of high-tech components are being manufactured overseas. American industry is losing its market share to foreign companies, especially those in the Pacific Rim - Japan, Taiwan, Hong Kong, Singapore and Korea - who are producing quality products at attractive prices.

As a result, the Department of Defense depends on foreign

sources for many high-tech components. This overseas source of supply could be cut off during a time of national emergency. Military activity, trade wars, embargoes, blockades and terrorism are but a few of the events which could disrupt the flow of components. Accordingly, such a disruption would make it difficult to produce weapons systems in a protracted military operation.

The few studies conducted to date indicate that if there would be a total cut off from foreign sources, production would drop to zero "for periods ranging from two to fourteen months, starting as early as the second month after M day. Items so effected were Sparrow, M-1 Tank, OH-58D, Sonobouy, F/A-18 and F-16."¹

This paper reviews the causes of this foreign dependency and what can be done about it.

Historical Background

The concern for foreign source dependency first developed during World War I. The United States required large quantities of raw materials such as bauxite, manganese, tin and natural rubber for use in war materiel. The Buy America Act of 1933 was the first United States Law responding to the foreign dependency issue. One of the purposes of this Act was to protect American industry's market share by requiring a 50 percent mark up on the estimated cost of foreign bids. Since 1933, the United States has negotiated bilateral defense trade agreements with 18 countries, mostly North Atlantic Treaty Organization members. These agree-

ments waive the 50 percent mark up.² The Pentagon argues that these agreements further the goal of rationalization, standardization and interoperability in the North Atlantic Treaty Organization and they are only approved in unusual circumstances. The Strategic and Critical Materials Stockpiling Act of 1939 was the second United States Law responding to the foreign dependency issue. One of the purposes of this law was "to decrease and prevent wherever possible a dangerous and costly dependence of the United States upon foreign nations for supplies of these (critical) materials in times of national emergency."³ The 1939 Act was subsequently amended to establish the present-day National Defense Stockpile. This stockpile consists of quantities of approximately 60 strategic raw materials. These materials are reserved for national emergencies.

In response to the Korean War, the Defense Production Act of 1950 was enacted. This Act is most known for providing the Government with the authority to prioritize and allocate materials and facilities to expand industrial production beyond consumer requirements in order to support national mobilization. However, the Act also provided a counterbalance "to actions occurring outside of the United States which could result in the termination or reduction of the availability of strategic and critical materials."⁴ Additionally, the definition of materials as originally established in the Strategic and Critical Materials Stockpiling Act of 1939 was amended to include not only raw materials but "articles, commodities, products, supplies, components, technical information, and processes."⁵

Dependency and possible vulnerability of the United States to foreign sources of supply was brought into bold relief with the catastrophic political and economic consequences brought on by the 1973 oil embargo. Since that event, defense and industry experts have indicated grave concern over a similiar situation occurring in such areas as non-fuel minerals, bearings, ferroalloys and electronics. Emerging from continuing studies on these areas was a recent phenomenon and potentially a more serious threat. It was the American dependency on foreign sources for high-tech components of major weapons systems.

Extent of Foreign Dependency

As indicated earlier, studies conducted to date conclude that there is an emerging problem of foreign dependency for high-tech components. The largest area of import penetration is electronic components. The more serious finding from these studies is the lack of information within the Department of Defense on how many components are obtained overseas. There is no data base which lists the types, quantities and original sources of manufacture. Additionally, there is no Department of Defense policy or office responsible for monitoring foreign dependency. All of this combined leads to a visibility problem in which the issue of foreign dependency is seldomly considered in the development of weapons systems.

CAUSES OF FOREIGN DEPENDENCY

The fundamental causes of foreign dependencies in United States weapon systems are national policies and the decline of the nation's industrial base.

National Policy

Offshore Production

The production of American equipment in other countries began in the 1950s. At that time, President Truman, concerned that the tension between the United States and the Soviet Union continued to increase, that China had turned to Communism and that the economies of Europe and Japan had not yet recovered from World War II, directed a joint State-Defense study which resulted in NSC-68, A Report to the National Security Council, dated 14 April 1950. One of the proposals in NSC-68 was that the United States take the lead in developing a healthy international community. The ultimate goal was to create the political and economic conditions in the West which could contain the Soviets. With regard to the economic end, the United States decided to join with its friends and allies, initially the member nations of the North Atlantic Treaty Organization and later Japan, Korea and Taiwan, to establish a common defense production effort. Accordingly,

military aid dollars were shifted from direct shipment of United States manufactured military equipment to offshore production for foreign claimants.⁶

This policy of offshore production did assist in strengthening the economies of our friends and allies. Unfortunately, the resultant free and easy access to American know-how and technology was also the beginning of the nation's foreign dependency problem faced today. Without this liberal attitude, the post World War II success of Western Europe and Asia would not have been conceivable.⁷ This transfer of technology and know-how has permitted the recipient nations to leap decades ahead in just a few years.

Today, offshore production continues through offset agreements. Offset is a term that encompasses a broad array of compensatory terms required by a buying country as a condition for their purchasing an item from a seller country. While the terms of offset agreements are only limited by the negotiator's imagination, the most commonly used terms are licensed production or co-production, industrial investment in or technology transfer and countertrade, whereby the seller purchases goods from the buying country. An example of such an agreement was concluded in 1975 between the United States and a consortium of four NATO countries, Belgium, Denmark, the Netherlands and Norway. The items purchased were 348 F-16s worth \$2.8 Billion. "The offset agreement stipulated that those countries be involved in the production of 40 percent of the value of their F-16s, 10 percent of the initial U.S. run of 650 F-16s and 15 percent of all U.S. sales of F-16s to third countries."⁸

Unfortunately, there is no indication that the use of offset agreements will decline. From 1980-1984, the International Trade Commission reported that 109 such government-mandated agreements for military equipment were negotiated. Additionally, foreign governments view this as a means to improve their balance of trade, to gain access to new markets, to utilize excess production capability and to upgrade their industrial base.

United States Philosophy of Free-Trade and Open-Markets

The global rush to industrialize since World War II has changed the role of governments in the economic process of industrialization. Instead of a free-trade and open-market orientation, foreign governments today have become directly involved in developing their nation's basic and high-tech industries through government protection and subsidies. Government assistance usually includes a combination of capital, research and development subsidies and administrative policies. The result is that the global economy is moving increasingly toward protectionism and away from free-trade and the open-market. Today, American factory workers and farmers are not competing one-on-one against their foreign counterparts, but against the foreign government itself.

While the United States does protect or subsidize some industries, its effort is meager in comparison to the elaborate programs found overseas.⁹ The United States' trade policy has steadfastly held as its principal objective the maintenance of a free-market international trading system. Accordingly, the

nation's approach has been essentially laissez-faire. Reliance on free-trade and the open-market has been the traditional means for economic development of the nation. The basis for this approach is that American businessmen, continually operating to produce better goods at competitive prices, will insure the most efficient means of allocating the nation's resources. However, even under a free-trade and open-market orientation, there is a role for the government. Government is needed to establish and to enforce international trading rules. Further, government is needed to protect American companies from unfair trade practices of foreign governments and firms. If the United States Government does not do something about this, the structure of the nation's industry will be determined by the industrial policies of foreign governments.

Environmental Protection

During the last 20 years, the Environmental Protection Agencies at both the Federal and State levels have increased their requirements for industrial compliance. Accordingly, some of the funds which could have gone to upgrading capital equipment and facilities were diverted to comply with Federal and State regulations. While the prime contractors have been able to comply, the sub-contractors that form the strength of diversification in the defense industry have not had the resources for compliance with the regulations and were driven out of business. Although there is no argument that the Environmental Protection Agency has necessary goals, it is not feasible to correct in a

few years what has taken 100 years to create. Many of the small firms would still be in business today had national security and reasonableness been applied in exercising compliance with regulations.

Decline of the Nation's Industrial Base

The nation's defense industry is grounded on the private sector's industrial and technological base. Defense materiel and consumer goods are produced from the same general industries. Therefore, a healthy private sector is critical. Weaknesses that appear in both the nation's smokestack and high-technology industries directly effect defense.

The Hollowing of American Industry

There is a new type of company developing in the United States. These are manufacturers who do little or no manufacturing. Instead of the traditional vertical manufacturing structure in which the company fabricates all of the critical parts, they import parts and assembled products from countries that can make quality items at low cost. The company puts its name on the product and sells it in the United States. Accordingly, these companies are becoming more service-oriented and less manufacturing-oriented performing profit-making functions from design to distribution but have little or no production base. A damaging side effect of this situation is the lower demand for other supporting industries such as steel, forgings, castings,

bearings and electronic components. In comparison to traditional companies which do virtually everything, these new companies are hollow.¹⁰

Lack of Growth in Manufacturing Capacity (Productivity Growth)

With regard to those companies which do manufacture, there is a lack of growth in manufacturing capacity. This is largely due from insufficient spending for new factories and equipment. This inadequate spending is attributed to a lack of capital funds. Businesses in the United States use depreciation as one of the principal sources of capital funds. However, the current tax system does not permit the recovery of costs. A study conducted by the Defense Industrial Board of the Committee on Armed Services found that, "industrial buildings are depreciated over a period of 30 to 45 years and industrial equipment is depreciated over periods of 6 to 12 years.... Furthermore, the depreciation of an asset allowable for tax purposes is based on the original acquisition cost and not on the replacement cost, which, during this era of high inflation rates, is substantially greater. High inflation rates appear to have had a notably negative effect on investment under the current method of depreciation. For example, if the compounded inflation rate is 15 percent, the replacement cost of a piece of equipment quadruples in 10 years. If the equipment is depreciated over 10 years, only 25 percent of the replacement cost is recovered. The very reason for depreciation - replacement of equipment and productive assets - is defeated."¹¹

As indicated above, the United States has one of the least supportive tax policies of the major industrialized countries. "For example, Switzerland allows 50 to 80 percent depreciation in the first year for new machinery, 100 percent is allowed in the United Kingdom in the first year, 95 percent in Japan in the first year and 100 percent in Canada in the first two years."¹²

By comparing the rate of industrial growth for the United States with other industrial nations, one notes that manufacturing growth has been dismal. The United States is being outstripped by almost all of its trading partners. "The manufacturing productivity of the United States increased only 4.5 percent from 1977 to 1981.... Japan's productivity increased by 29.4 percent, Belgium by 23.6 percent, France by 14.5 percent, Germany by 12.8 percent, Italy by 20.9 percent, the Netherlands by 16.8 percent and the United Kingdom by 3.8 percent."¹³ For Japan, this means that its productivity now exceeds that of the United States in steel, transportation equipment and electrical (general and precision) equipment.

The Profit Motive

Today, American industry takes a short-term view with regard to profit. To maximize short-term profit, industry underinvests in new plants and equipment. Older industries become less efficient and less competitive with foreign producers. The immediate result is loss of market share to imports. In the long-term production lines cease altogether.

The profit motive also (1) discourages capital investment in

plants and equipment to meet peak demand (necessary to meet war-time surge requirements) because maintaining unused capacity is costly; (2) encourages use of off-shore production to take advantage of the lower cost of labor and transportation; (3) maintenance of inventories at minimal levels to reduce costs; and (4) encourages worker layoffs during business downturns. The result is minimal growth in manufacturing capacity, increased foreign dependency, a less well-trained workforce and small inventories to meet sudden and substantial increases in defense requirements.¹⁴

An Undereducated Workforce

The United States has a shortage of engineers and skilled blue-collar workers. The nation's post secondary education system trains too few engineers to keep pace with the changes in technology being generated today. In 1981, the capacity of the nation's colleges and universities to graduate engineers was 50,000 per year. This is far below the requirement. Additionally, foreign students make up 40 percent of the total enrollment for engineering at the masters level and 47 percent at the doctoral level. Only 40 percent of these foreign students remain in the United States after graduation. In contrast, Japan, with half the population of the United States, graduates more mechanical engineers and 50 percent more electrical engineers.¹⁵ In 1985, the tool and machinery industry was short 240,000 machinists, 10,000 of which were needed in defense industry. The Bureau of Labor Statistics estimates that through 1990 there will be 22,000 an-

nual openings for machinists in the United States. However, apprenticeship programs provide only 2,800 per year.¹⁶ The result is an insufficient pool of talent.

The general decline of primary and secondary education since the 1960s poses a long-term threat to the nation's vitality. Evidence of this decline is documented in several studies commissioned by both government and industry. Reported are deficiencies in the fundamentals of English, mathematics, reading and science. The President's Commission on Industrial Competitiveness found that, "Although in 1982 an unprecedented 71 percent of the population aged 25 and over had a high school diploma, our elementary and secondary education system continues to fail to achieve excellence in the basics, graduating youth who are ill prepared for either work or further education."¹⁷

Displaced workers are a by product of today's rapidly evolving technology. Displaced workers are those workers whose jobs have become obsolete due to such things as product improvements, better manufacturing technology or loss of a market share to a foreign source. These displaced workers need to be retrained and returned to the marketplace with the next generation of skills.

WHAT CAN BE DONE ABOUT FOREIGN DEPENDENCY?

Develop a Comprehensive National Trade Policy

In contrast to the major industrial nations, all of whom

have established trade and industrial strength as national policies, the United States has no policy pushing trade and industrial development. The predominant philosophy in the United States is to avoid interfering in the marketplace. The intent is to allow market forces to take their natural course. The Government has intervened on behalf of various interest groups over the years. However, this response has been spotty and not part of an over-arching trade policy designed to strengthen the nation's industrial base and that base's competitiveness overseas.

A Comprehensive national policy would include a broad range of economic actions; e.g., import quotas and tariffs, reduced taxes and subsidies. By having a national policy, the wholesale use of protectionist and subsidy measures is not being suggested. Economic action would be taken as a last resort to persuade foreign governments to follow fair trade practices. Once fair trade is re-established, the economic action would be lifted. The problem with such measures is that in the long-term, they strangle competition and reduce the advantages - efficiency and innovation - associated with competition. Additionally, industries receiving support could become dependent on it and fail to make the necessary management decisions to regain their competitive edge in a free-market environment.

The legal basis to support a national policy is in place. International agreements such as the General Agreement on Tariffs and Trade (This is an international agreement which outlines the obligations for fair trade among nations.) and domestic laws such as the Defense Production Act of 1950 which authorizes action to

remedy unfair trade practices. When foreign governments or their industries take action which adversely influences American industry, the Government has the legal basis and should enforce the nation's rights. This action by government can at least ameliorate the competitive disadvantages that many of the nation's industries have due to unfair international trade practices.

Recognize Global Economic Interdependence

To be effective, the United States must accept the fact that today there is a global economic interdependence. By looking at the percent of foreign trade to gross national product, this is amply demonstrated. Two decades ago, foreign trade was eight percent of the nation's gross national product. Today, it is twenty percent.¹⁸ These statistics indicate that the United States, once largely immune to change in other economies and the economic policies of their governments, is today increasingly reacting to change in the international marketplace. Accordingly, it is necessary for the Government to make decisions which take into account global economic forces. The laissez faire approach of the Government to industrial issues may have been an appropriate policy through the early 1970s. It is not realistic today. The Government has a role to play in creating an environment that strengthens the nation's industry.

Manage Foreign Dependency

The Department of Defense needs to manage foreign dependency. While this is no easy task, it can be done.

First, the extent of foreign dependency needs to be determined. There is little or no visibility in the form of data on dependency at the component level in United States' weapons systems today. A data base needs to be developed to define the problem.

Second, imported components for a weapon system should be accounted for during the research and development and design phases rather than have the foreign dependency issue surface as an Achilles' heel after its deployment. During early research and development for a future weapon system, substitute materials and components could be sought to at least ameliorate the problem. Raw materials provide an analogous view. Substitute materials will soon be available to replace many critical raw materials. Today, copper, tin, aluminum and steel are being replaced with ceramics and composites. There is no reason to not believe that substitute materials will eventually replace cobalt, chromium and beryllium.¹⁹

Third, dependency and vulnerability need to be separated. Dependency does not necessarily equal vulnerability. In its extreme form, the concern over foreign dependency implies a requirement for self-sufficiency. However, self-sufficiency ignores the fact that economies today are global and they are interdependent. Additionally, self-sufficiency ignores the fact that it is very costly to manufacture everything in the United States. Therefore, the task is to determine which dependencies are vulnerabilities and then decide how to deal with the vulnerabilities. The following are two examples of what can be done.

One of the situations that this analysis of dependency versus vulnerability will surface is that some dependencies are self-imposed. There are items which could be produced domestically but are not for the simple reason that imports are less expensive. Fortunately, the United States has in being a contingency for terminating such critical imports when required. It is title III of the Defense Production Act of 1950.

In a 1987 study of the foreign sourcing issue for 17 precision-guided munitions, the National Defense University's Mobilization Concepts Development Center found that approximately 2 percent of the \$6 billion spent annually on precision-guided munitions went for components purchased offshore. The study concluded that a stockpile of these foreign-sourced components, valued at \$15 million, could buffer against a complete cut off until the nation's industry could fill the gap.²⁰

Increase the Supply of Capital to Industry

One vital ingredient for increasing productivity is having sufficient capital. An immediate solution is for the Federal government to develop tax laws that permit companies to quickly recover the cost of modernizing plants and equipment. This form of capital generation allows companies to continue modernizing every few years to keep pace with changing markets and technology.

The national supply of capital which can be made available to industry can be increased through individual savings and Federal budget deficit reduction. Americans are spenders, not savers. The nation's savings lag far behind that of our trading

partners. The low individual savings rate is due to the American tax system which encourages borrowing rather than saving. Couple the low national saving rate with the Federal budget deficit and the supply of available capital is further diminished for the reason that the Government has first bid to obtain the funds it needs. One solution is to change the tax laws to encourage saving. The Bush administration has recently begun such an initiative. However, more importantly the deficit needs to be reduced. A lower deficit means that the Government has a lesser requirement for monies. The result will be a greater supply of capital for private sector investment.

Educate the Workforce

While establishment of a national policy, recognition of global interdependence, management of foreign dependency and increasing the availability of capital are important, it is the people of a country who determine how well these improvements will be used. Accordingly, the nation's human resources need to be part of any strategy aimed at reducing foreign dependency. To enhance the quality of the nation's human resources, a few areas need to be addressed.

First, the quality of education in the elementary and secondary education system must be improved. The focus should be on the basics of reading, writing, computation and problem solving. For those students who have a higher level of analytical skills, mathematics and the sciences should be made available. Improving educational quality can be a reality with curriculum

reforms, better teachers and the use of new teaching methods. The nation can no longer afford a large number of undereducated workers. The extent of technology in the workplace today and that projected for the future calls for workers who are better educated and more highly trained than today's workforce.

With regard to solving the problem of a shortage of engineers and skilled blue collar workers, Federal and State governments will have to take the lead. To encourage the nation's best students to enter these fields, stipends or grants have to be made available. Subsidies and tax incentives need to be provided educational institutions to increase the size of their faculties and expand the size of their schoolhouses to accommodate the larger numbers of students which are needed to sustain the nation's technological leadership in the world.

CONCLUSION

Over the past century, the United States has experienced an effortless industrial expansion. Continued economic strength was taken for granted. Blessed with natural resources, a skilled workforce and untouched by war, the United States dominated the global marketplace through the mid 1960s.

However since the 1960s, the global marketplace has changed around us. Robust new competitors in Europe and the Pacific are directly challenging many of America's largest and most success

ful industries, offering high-quality merchandise at prices far cheaper than can be produced in the United States. Technology is changing rapidly, and it quickly crosses national borders. Foreign countries are aggressively using this technology along with their cheap labor to penetrate industries where the United States has been the traditional leader. One such industry is the high-tech component industry. Studies to date indicate that foreign dependency in this area is an emerging problem.

While there is no single action or simple solution to reverse foreign dependency, it is reversible. Government, industry and the workforce have roles to play. If the issue of foreign dependency is not addressed by these groups, the nation's industrial base will be shaped by our competitor's policies and national security will be adversely effected.

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